

**BRITISH COLUMBIA REVENUE NEUTRAL CARBON TAX:
LESSONS LEARNED FOR THE U.S. AND BEYOND**

*A Resource Paper by:
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October 2018*

BRITISH COLUMBIA REVENUE NEUTRAL CARBON TAX

I. SUMMARY: LESSONS LEARNED FOR THE U.S. AND BEYOND

The BC carbon tax has been a political success, had negligible effects on economic performance, addressed impacts on low and moderate income households, altered consumption behavior and reduced emissions from fossil fuels in the *initial stage* of the 'grand experiment.' [Murray and Rivers 2015]

- **It reduced emissions.** During first phase (2008-2012), the tax rose from \$C10/ton/CO₂ to \$C30 making it among the highest broad-based carbon prices in the world. It met the BC Interim Goal of at least a 6% reduction. (BC Ministry of Finance, World Bank 2016). Six studies using different established methodologies provide a reasonable degree of confidence that the tax reduced fuel consumption and emissions 5-15% (Murray, Rivers)
- **The revenue neutral tax was progressive.** Revenue neutrality was critical for passage; tax cuts and household payments exceeded carbon tax revenues. Households paid 27% of the carbon tax and received 36% of the tax cuts and rebates (BC Ministry of Finance 2016). Interim review indicated progressive household impact until 2020.
- **It achieved political collaboration.** It was introduced by the center-right party (Liberal Party) with support from environmentalists, business and academics. The center-left NDP Party added support in following elections.
- **Public opinion support, initially under 50%, grew to over 60%.** There were similar results in other provinces when asked about introducing the policy for their jurisdictions. (EnviroNics Institute 2015)
- **It was a model for Canada.** The experience fostered support for a national carbon tax policy to start in 2019 at \$C10 rising to \$C50/ton by 2022.
- **There was no indication of negative impact on economic growth.** The Gross Domestic Product (GDP) of BC grew +0.5% for 2008-2013 while the rest of Canada grew at +0.4%/year.
- **The tax paused at \$C30/ton/CO₂ in 2013 due to the failure of other countries and provinces to initiate comparable pricing; it resumed in 2018 at \$C35/ton.** BC plant greenhouses were exempted because competitors from Mexico and California had no or low carbon pricing. BC, a sub-national jurisdiction, couldn't apply Border Carbon Adjustment (duties).

II. BC CARBON TAX DESCRIBED

Background: BC's electricity system is essentially carbon free based on hydropower and renewable energy and causes less than 5% of BC emissions. Consequently, the BC did not have "low hanging fruit" (coal power plants) to achieve emission reductions but had to reduce emissions in the more difficult sectors of industry, transportation and households.

Ease of Implementation: The policy was introduced in February and took effect in July 2008. This short period contrasts with the lengthy design experience of regulatory programs and cap and trade.

Gradual Increase: It started at \$C10/ton/CO₂ in 2008 and increased \$5/year to \$C30/ton in 2012 where it was paused. Price escalation resumed in 2018 and rose to \$C35/ton. It is among the highest systemic carbon prices in the world.

Coverage: It covers fossil fuel combustion entities which account for 70% of emissions including stationary combustion sources such as industry and utilities (33.2%) and transportation (37.9%). Emission sources not easily measured or controlled were excluded: afforestation and deforestation (5.8%); waste (6.1%); agriculture (3.3%); fugitive sources (7.8%); and industrial non-combustion processes (5.8%). [Source: BC Ministry of Environment, 2014a.]

Revenue Neutrality: Implementation was *revenue negative* as personal and corporate tax cuts and payments to households and businesses were \$700 million greater than carbon tax revenues during 2008-2014. Tracking household equity impact is more difficult with revenues distributed via tax cuts versus dividends:

Households: Low Income Climate Action Tax Credit of \$115/adult and \$34/child or approximately \$300 for a family of four; Northern and Rural Climate Action Dividend of up to \$200; and lowest two income tax bracket rates were reduced 5 percentage points.

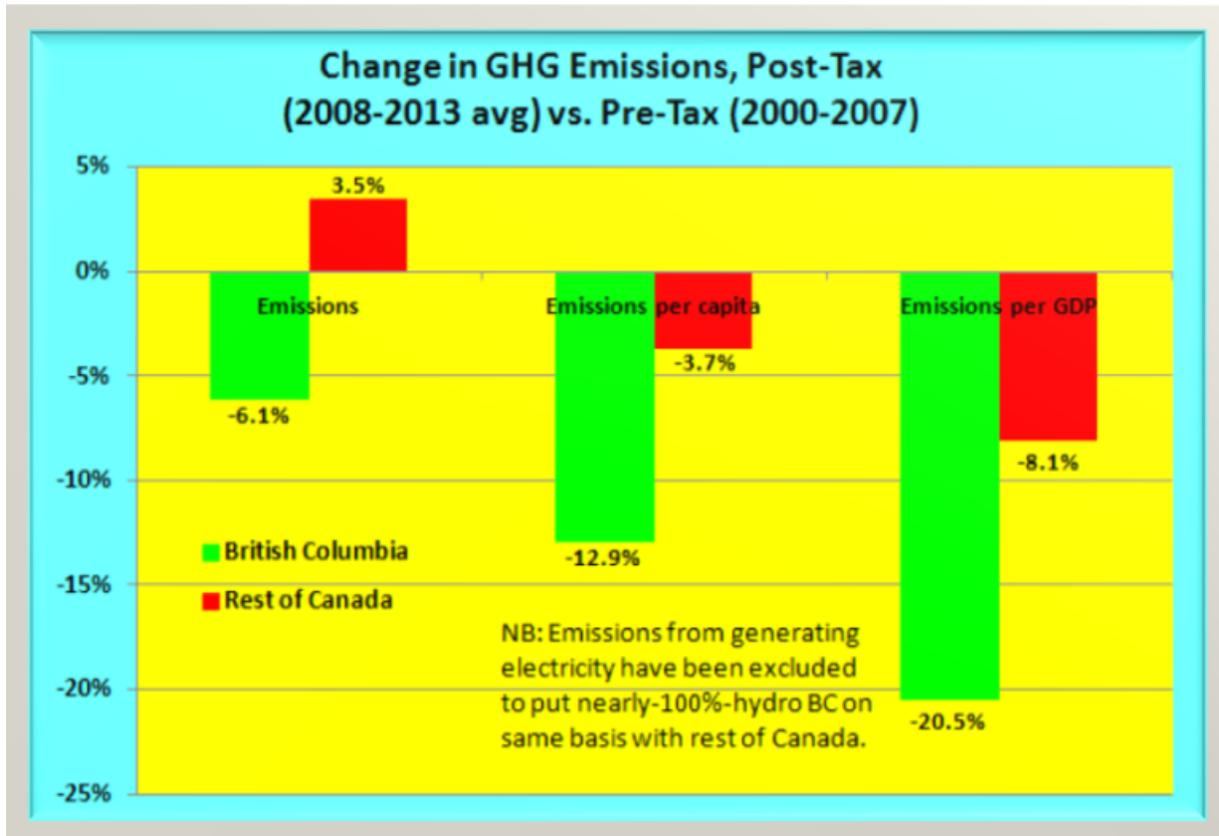
Businesses: Corporate tax rate cut from 12% to 11%; small business tax rate cut from 4.5% to 3.5% and then 2.5%. (BC Ministry of Finance 2015)

Competition Risk and Leakage: BC, a subnational jurisdiction, could not impose a Border Carbon Adjustment to balance trade with countries without comparable carbon pricing (U.S., Mexico, China, etc.). No support payments were made to industry. Plant greenhouses were exempted as was farm fuel in 2014 due to external competition where there were no carbon prices.

III. KEY FINDINGS

A. Emissions Were Impacted

The BC 12.9% per capita emissions decline during the 2008-2013 tax period compared to 2000-2007 was three-and-a-half times as pronounced as the 3.7% per capita decline for the rest of Canada. [Komanoff and Gordon 2015]



Source: Komanoff and Gordon, 2015

Six studies on emissions using different established methodologies gave results of the same magnitude. This provides a reasonable degree of confidence for concluding that the effect of the tax was to reduce fuel consumption and emissions 5-15% in BC. [Murray and Rivers 2015]

The carbon tax impact on gasoline consumption was notable. At \$30/ton/CO₂, one analysis attributed a reduction of 11-17% in gasoline sales due to the tax effect. The study controlled for other factors that could affect gasoline sales such as income, prices, the business cycle and public transit investments. The study found that the tax effect (“tax salience”) is much larger than would be

expected if consumers were responding to a similar market-based price spike. (Rivers and Schaufele 2012; also Bernard, Guenther, Kichian 2014)

Sorting out causality for the emissions impact is challenging during an economic recession. However, *the existing analyses give credence to the view that the visible, predictable rise in the tax impacted fossil energy consumption decisions by industry and households.*

B. Economic Growth—No Discernable Negative Impact

The simple comparison of the BC Gross Domestic Product (GDP) with the rest of Canada for 2008-2013 shows BC at +0.5%/year and the rest of Canada at +0.4%/year. (Statistics Canada, 2015 Table 384-0038 and Murray, Rivers 2015).

The employment impact studies indicate mixed findings. Three studies show: (i) a small but statistically significant 0.74 percent annual increase in employment over the 2007-2013 period (Yamazaki 2017); (ii) no significant effect on employment at the provincial or industry level (Azevedo, Wolff, Yamazaki 2017); and (iii) slight adverse employment impact (Yip 2017).

There is no basis for negative conclusions about the impact of a \$C30 carbon tax on the British Columbia economy.

C. Distributional Effect on Households was Likely Progressive: Households paid 27% of the carbon tax and received 36% of the tax cuts and rebates focused on the bottom 40% of households. (Ministry of Finance 2016; Beck 2015). Interim analysis indicated a progressive impact to 2020 (Melton, Peters 2013). The 2018 tax increase to \$C35/ton will be offset by increasing the carbon tax credit for low income households equivalent to the projected cost increase (BC 2018 Budget).

D. The 2013-2017 “Pause” in Tax Escalation: In 2013 the BC Government paused the tax at \$C30/ton citing that other jurisdictions had not followed suit with comparable carbon pricing. (Globe and Mail, April 3, 2013) It restarted in 2018 with an increase to \$C35/ton with a target of \$50/ton by 2021.

E. Public Support Grew Over Time:

Political Success: The 2009 and 2013 elections confirmed public support for the 2008 carbon tax. It was introduced by the Liberal Party (center right) with a coalition of environmental groups, academics and the business community. The opposing NDP Party (center left) subsequently switched to support the tax. (Harrison, Kathryn, OECD Environmental Working Paper, October 8, 2013)

Public Opinion Success: “A clear and growing majority of British Columbians (60%) endorse their provincial carbon tax (compared to under 50% pre-tax), and a similar proportion elsewhere in the country would support such a tax in their own province to address climate change.” (EnviroNics Institute 2015).

F. BC Carbon Tax Influenced National Policy: The BC experience and positive public opinion created the political environment that facilitated development of a “backstop” national carbon tax policy scheduled to take effect in 2018 for any province failing to put in place a carbon price. The key elements of the policy are:

--Carbon tax of \$10 per ton of CO₂ in 2018 increasing by \$10 per ton annually to \$50 per ton in 2022; and

--Revenues will be returned to the provincial governments who will decide on their disposition. (Government of Canada, Federal Carbon Pricing Backstop, January 2018)

G. Revenue Neutral Policy—BC Tax Swap vs. Dividend Approach: The 2008 BC policy was predominantly a “tax swap” i.e., the carbon tax was offset by corporate tax reductions and personal tax cuts for the lowest 40%. (Government of British Columbia, Corporate Income Tax Rates and Business Limits, 2014).

A tax swap policy can only approximate neutrality, unlike a carbon dividend, because of economic and revenue variations and tax complexities. In fact, BC tax cuts and payments to households *exceeded* the carbon tax revenues by \$700 million during 2008-2014. (BC Government Revenue Neutral Carbon Tax)

The efficient across the board corporate tax cut policy gave way to “favored industry” tax cuts in 2014 for the motion picture industry. If revenues had gone to household dividends instead, it would have been more difficult to divert them to special interests. (n.b. the Alaska Permanent Fund experience).

The End of Revenue Neutrality: The 2017 election resulted in a formal agreement between the NDP (Center left) and Green Party. They resumed the steady escalation of the carbon tax from \$C30/ton to \$C35/ton on April 1, 2018 with a target of \$50/ton by 2021. Less noted was their 2018 Budget: it deleted revenue neutrality for undefined expenditures on (a) low- and moderate-income tax relief; (b) emissions intensive industry; and (c) new green initiatives. [BC Government Budget, 2018]

Lesson Learned: Revenue neutrality (and household equity) may be easier to maintain with a household dividend than with tax swaps.

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IV. Appendix A

Addressing Incorrect Narratives

Misleading claims about the successful BC carbon tax experience do arise. Below are some examples and responses.

1. CLAIM: Carbon tax fails to have long-term impact on greenhouse gas emissions--BC achieved only minimal and short-term province-wide greenhouse gas emissions reductions immediately after the tax was implemented.

SUMMARY RESPONSE: By ignoring the difference between short-term actions and long-term outcomes (and several analyses), one would incorrectly conclude long term failure based on a relatively short first phase of the BC carbon tax (2008-2012). Such a claim ignores the fact that the rising carbon price was paused in 2013.

2. CLAIM: Carbon taxes put the costs and responsibility on individuals instead of holding polluters accountable for destroying our planet.

SUMMARY RESPONSE: This claim is contradicted by extensive research and case studies. Carbon tax costs are born by both industry and households to varying degrees depending upon the industry and market conditions. A study of the potential impact of a carbon tax on industries indicated that various industries absorb from 25% to 67% of the carbon tax. (Ganapat, Shapiro, Walker 2016)

3. CLAIM: Regulation should be primary and carbon pricing a backup (like California).

SUMMARY RESPONSE: Canada has decided the reverse of California: carbon pricing should be primary and regulation supplementary as described below. (Canada Ecofiscal Commission, "Supporting Carbon Pricing: How to Identify Policies that Genuinely Complement an Economy-Wide Carbon Price" June 2017)

Clean energy subsidies and mandates (i.e., non-pricing policies) should have any of three following rationales for complementing carbon pricing:

- i) Gap-filling policies that impact emissions not covered by carbon pricing;
- ii) Signal boosting policies to strengthen market signals where a carbon price is weak; and
- iii) Benefit expanding policies that achieve both emission reductions and other objectives.

Three key recommendations of the Ecofiscal Commission are:

- i) (Provincial) Governments should make carbon pricing the core of their climate policy, with steadily increasing stringency;
- ii) Governments should clearly demonstrate complementarity before adopting non-pricing policies; and

iii) With the implementation of an economy-wide carbon price, governments should phase out and avoid redundant, high-cost, or ineffective policies.

4. CLAIM: From 2011-2014, the total *taxed* greenhouse gas emissions rose by 5.3% while total *non-taxed* greenhouse gas emissions decreased 2.5%.

SUMMARY RESPONSE: This comparison is “apples & oranges”; the two categories are not comparable.

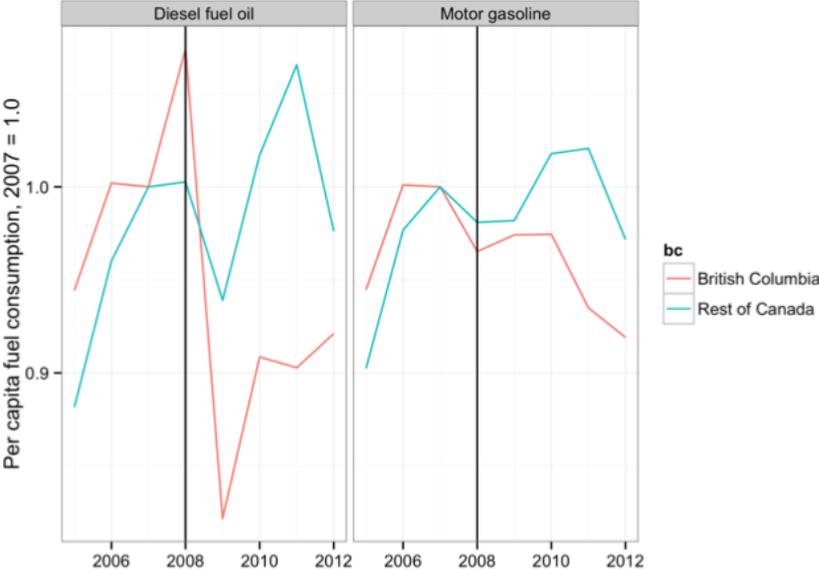
“Non-taxed” emissions are deforestation, afforestation, enteric fermentation (cow gas), manure measurement, etc. These have serious measurement problems and are different from what the BC carbon tax covers: measureable fossil fuel combustion which are 70% of emissions. (BC Ministry of Finance, Myths and Facts About the Carbon Tax, 2014 and Hoberg, George et al. October 2015).

5. CLAIM: *The comparison [of BC and Ontario] demonstrates that the mandatory [regulatory] replacement of fossil fuel energy plants with renewable, carbon-free forms of energy can rapidly and permanently reverse emissions trends.*

SUMMARY RESPONSE: This claim doesn’t support the conclusion that regulatory policy is superior to a carbon tax. It is flawed in three ways: (1) **inappropriate comparison** (“apples and oranges”) of BC’s broad carbon tax policy impacting all fossil fuels with Ontario’s **sub-sector** coal power plant regulation (“low hanging fruit”); (2) **incorrect claim** that Ontario’s regulatory approach was “rapid” (it took 10 years from 2003 to 2013—7 years past original target); and (3) **incorrect claim** that Ontario’s replacement power for 7500 Megawatts of coal plants was “renewable carbon-free energy”. It wasn’t. It was 10,000 Megawatts of new natural gas plants with only 2000 Megawatts of wind. Also, nuclear generation expanded to replace coal (and gas). (Schneider, Keith; Yale Environment 360, April 2, 2013.) (Harris, Melissa; IISD, June 2015)

APPENDIX B – Gasoline Use Impacted by Carbon Tax (Source: Duke, 2015)

Figure 2. Trends in gasoline and diesel fuel oil sales in British Columbia and the rest of Canada, 2005-2012



Source: Data from Statistics Canada, Tables 134-0004 and 0051-0001.

Note: The vertical black line indicates introduction of the carbon tax.

END NOTES

The 2012 Canadian dollar figures cited were 1:1 with the U.S. dollar during 2008-2012 e.g., \$C30/ton = \$US30/ton. The current exchange rate is approximately 1.25:1, e.g., \$C30/ton = \$US24/ton.

Azevedo, Wolff, Yamazaki; "Do Carbon Taxes Kill Jobs? New Heterogeneous Evidence from British Columbia" 2017.

Bernard, J.-T., G. Guenther, and M. Kichian. 2014. "Price and Carbon Tax Effects on Gasoline and Diesel Demand." Manuscript.

Beck, M, N. Rivers, R. Wigle, and H. Yonezowa. "Carbon Tax and Revenue Recycling: Impacts on Households in British Columbia." Resource and Energy Economics, August 2015.

BC Ministry of Finance, Myths and Facts About the Carbon Tax, 2014 (Taxed and untaxed)

<http://www.fin.gov.bc.ca/tbs/tp/climate/A6.htm>

British Columbia Ministry of Finance. 2015. How the Carbon Tax Works. <http://www.fin.gov.bc.ca/tbs/tp/climate/A4.htm>

BC Government Budget, 2017

http://bcbudget.gov.bc.ca/2017_Sept_Update/bfp/2017_Sept_Update_Budget_and_Fiscal_Plan.pdf

BC Ministry of Finance, 2014

BC Ministry of Finance, Carbon Tax Review, 2015

http://www.fin.gov.bc.ca/tbs/tp/climate/Carbon_Tax_Review_Topic_Box.pdf

BC Ministry of Finance, Partnership for Market Readiness Technical Workshop, World Bank, February 2016

<https://www.thepmr.org/system/files/documents/BC%20Carbon%20Tax%20-%20World%20Bank%20PMR%20February%202016.pdf>

"BC's Clark Vows to Freeze Carbon Tax for Five Years" Globe and Mail, April 3, 2013

<https://www.theglobeandmail.com/news/british-columbia/bcs-clark-vows-to-freeze-carbon-tax-for-five-years/article10728482/>

Canada Ecofiscal Commission, "Supporting Carbon Pricing: How to Identify Policies that Genuinely Complement an Economy-Wide Carbon Price" June 2017.

Elgie, Stewart, and Jessica McClay. 2013. "BC's Carbon Tax Shift Is Working Well after Four Years (Attention Ottawa)." Canadian Public Policy 39(2):1-10.

Environics Institute “Canadian Public Opinion About Climate Change”, 2015 p. 6-7

Ganapati, Sharat, Yale University; Joseph Shapiro, Yale University and NBER; Reed Walker, University of California, Berkeley and NBER, “Energy Prices, Pass-Through and Incidence in U.S. Manufacturing”, March 2016.

Globe and Mail, April 3, 2013 “Premier Christy Clark is promising to freeze the province's carbon tax for five years if her Liberals are re-elected in the May election. Ms. Clark said the carbon tax, instituted in 2008 as North America's only such levy to try to curb increases in the use of greenhouse-gas emissions, made B.C. a climate-change leader. She said, however, that it was time for other jurisdictions to catch up so B.C.'s competitiveness will not be impaired.”

Government of British Columbia, Corporate Income Tax Rates and Business Limits

<https://www2.gov.bc.ca/gov/content/taxes/income-taxes/corporate/tax-rates>

Government of British Columbia, Revenue Neutral Carbon Tax

<https://www2.gov.bc.ca/gov/content/environment/climate-change/planning-and-action/carbon-tax>

Government of Canada, Federal Carbon Pricing Backstop; January 2018

Government of Canada, “Pricing Carbon in Canada: How it Will Work”, June 21, 2017

Gulati, S., and Z. Gholami. 2015. “Estimating the Impact of Carbon Tax on Natural Gas Demand in British Columbia.” Sustainable Prosperity

Harris, Melisa; Marisa Beck, Ivetta Gerasimchuk; “The End of Coal: Ontario’s Coal Phaseout, Institute for Sustainable Development, June 2015.

“Overall, coal capacity in the province was largely replaced by natural gas, with renewable energy playing a secondary role in this shift. This can be explained in part by the plummeting price of natural gas in the US.”

Harrison, Kathryn “The Political Economy of the British Columbia Carbon Tax”, OECD Environmental Working Papers, October 8, 2013

http://www.oecd-ilibrary.org/environment-and-sustainable-development/the-political-economy-of-british-columbia-s-carbon-tax_5k3z04gkhhkg-en

Hoberg, George, Guillaume Peterson St-Laurent, Gabrielle Schittecatte, and Caren Dymond, “Forest Carbon Mitigation in British Columbia – Policy Issues and Options”, Working Paper, October 2015. The paper is part of the Pacific Institute for Climate Solutions Forest Carbon Management Project.

Komanoff, Charles and Matthew Gordon, “British Columbia Carbon Tax: By the Numbers”, December 2015

Melton, Noel and Peters, Jotham, “Is British Columbia’s Carbon Tax Good for Household Income” Working Paper, Navius Research, Inc. July 2013

Murray, Brian C., and Nicholas Rivers “British Columbia Revenue Neutral Carbon Tax: A Review of the Latest “Grand Experiment in Environmental Policy”,” Duke University, Nicholas Institute, Working Paper NI WP 15-04, May 2015 {“Determining the success of the policy in this regard requires comparing actual GHG emissions in the province after the policy was implemented with a counterfactual scenario estimating emissions in the province in the absence of the tax.”]

Rivers, N.J., and B. Schaufele. 2015. “The Effect of Carbon Taxes on Agricultural Trade.” *Canadian Journal of Agricultural Economics* 63(2).

Rivers, Nicholas; Brandon Schaufele, University of Ottawa, “Salience of Carbon Taxes in the Gasoline Market”, June 10, 2013

“We demonstrate that the carbon tax imposed by the Canadian province of British Columbia caused a decline in short-run gasoline demand that is significantly greater than would be expected from an equivalent increase in the market price of gasoline. That the carbon tax is more salient, or yields a larger change in demand than equivalent market price movements, is robust to a range of specifications.”

Schneider, Keith, “How Ontario is Putting an End to Coal Burning Power Plants,” April 2, 2013, *Yale Environment* 360.

http://e360.yale.edu/features/how_ontario_is_putting_an_end_to_coal-burning_power_plants

“In 2003, Ontario generated 7,500 megawatts of coal-fired electricity, a quarter of its power supply. In Ontario, 17 new natural gas-fired generating stations have been built and, with 10,000 megawatts of capacity, have replaced the generating capacity that came from coal. Wind generating capacity now measures 2,000 megawatts. Both gas and wind, though, have prompted civic dissent. Citizen opposition forced the cancellation of gas-fired plants in...two suburbs of Toronto. And wind farms have attracted opposition in rural areas. Ontario issued a formal moratorium for offshore wind development in Lake Ontario.”

Statistics Canada, 2015, Table 384-0038

Yamazaki, Akio, University of Calgary, “Jobs and Climate Policy: Evidence from British Columbia's Revenue-Neutral Carbon Tax”; *Journal of Environmental Economics and Management*, Vol. 83 pp. 197-216, 2017

Yip, Chi Man, *The Labor Market in the Aftermath of a Carbon Tax*, 2018